

## Research Note

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# Rationality judgment of traditional soil reclamation and soil fertility practices for sustainable agriculture by farm women

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Farm women are the backbone of Indian culture. Eighty per cent of the economically active women are engaged in activities of sowing, transplanting, weeding, manuring, harvesting, threshing and storage etc. In true sense, farm women are the storehouse of indigenous knowledge and experience with respect to agriculture, which can form very good base for further development. Women can be extremely useful in identifying local farm resources, an aspect critical for success of agricultural production. They are diligent in showing the ways to develop traditional agricultural practices and strategies appropriate for local situations. There is an urgent need to blend modern scientific knowledge and the indigenous agricultural technologies to draw a line between the popular superstitions from rational indigenous technologies, so the later one deserve to be encouraged through scientific study and research. Higher productivity, cost effectiveness, non- polluting, hazardless ness, easy availability, stability, safety and sustainability are the basic characteristics of traditional agricultural practices, which

should be strengthened by scientific explanation and documentation. Similar efforts were made in the present investigation by assessing the scientific rationality of the traditional soil reclamation and soil fertility management practices followed by farm women. The study was conducted in three selected Panchayat Samities namely Bikaner, Nokha and Lunkaransar of Bikaner district of Rajasthan. A sample of 150 farm women was drawn by using simple random sampling technique. Besides that 20 subject matter specialists (SMSs) were also selected from the relevant field of agriculture for the study purpose. Out of the identified traditional soil reclamation and soil fertility management practices, in the aspect of soil reclamation, 85 per cent of the SMSs had reported that the traditional practice of “using gypsum for reclamation of alkali soil” had a scientific rationale. Out of various indigenous practices for enhancing soil fertility, 90 per cent of the SMSs has perceived that the traditional practice of “incorporation of earthworms in bulk to make soil porous and fertile” had a scientific rationale. Thus, it

can be recommended that traditional soil reclamation and soil fertility management practices having scientific rationality should be popularized among farm women by organizing demonstrations and field visits, which ultimately enhance their extent of utilization. The extension agencies functioning in the area of investigation needs to create more awareness about traditional soil reclamation and soil fertility management practices and motivate the rural clientele to adopt these traditional practices having scientific rationality. Scientifically acceptable traditional soil reclamation and soil fertility management practices should be given heights by media and literature, so that the users of these practices can feel assurance and confidence while using these practices.

Traditional agricultural practices are the sum total of knowledge and wisdom, based on the accumulated experiences in dealing with problems and situations which are specific for a particular culture. Much of this existing knowledge about traditional practices has not been consolidated and put together as these are unwritten and untapped knowledge, which is concrete and relies strongly on institution, historical experiences and directly perceivable evidences. Wardell (2009) opined, “it is untapped unwritten body of knowledge which is held in brains, languages and skills in many groups, languages, culture and environment.”

Although the traditional practices or knowledge are the outcomes of daily experiences of local people, they are still in vague and not have any scientifically supported framework. If these ages old practices are integrated with scientifically acceptable basis, then it will definitely result in making the practices convincing and credible to the rural people especially to the farming community. So there is an urgent need to safeguard and reaffirm traditional agricultural practices among farmwomen and encouraging them to adopt scientifically valid and acceptable traditional practices that are need based, better problem solving, locally available, more intelligible and credible to the rural clientele.

Therefore, much work has to be done to locate, document and disseminate traditional knowledge so that it can become part of body of sustainable development. As there is common proverb in the African society “when a knowledgeable old person dies, a whole library disappears,” so unless we make urgent and quicker efforts to track this valuable knowledge, it will be lost soon, not to be regained at any cost.

With these considerations in mind, the present investigation on “rationality judgement of traditional soil reclamation and soil fertility management practices for conservation agriculture by farm women” has been undertaken to assess the scientific rationality of the traditional soil reclamation and soil fertility management practices followed by farm women.

Although there is a scarcity of literature directly related to the problem under study, literature and researches, which appeared to be pertinent and relevant to the present study has been procured after much consistent and sustained efforts to provide adequate theoretical support to the purpose of present study. Gupta (2006) found in his study in dry lands of Coimbatore that for increasing soil fertility, cattle herd are kept overnight on the cultivated land, so that the dung and urine ejected can be directly absorbed by the soil. It is followed in summer when the land is free from crops.

He also reported that the *Dolichos lab-lab* is mixed with sorghum and broadcasted. The purpose is to get additional yield and improved soil fertility through nitrogen fixation.

Saviozzi *et al.* (2011) reported that wheat straw (WS), pig slurry (PS) and a mixture of the two materials (WSPS) play a significant role in maintaining soil fertility and in promoting sustainability of soil.

Kumar *et al.* (2008) found that farm women test the soil by visual observation or touching as they are using this practice traditionally. They considered yellow soil productive for the crops

Umarani *et al.* (2009) reported that tribal farmers of Loohardaga in Bihar, use to burn dung cakes as soil treatment practices in nursery plants of finger-millet (*Eleusine carocana*) prior to land preparation

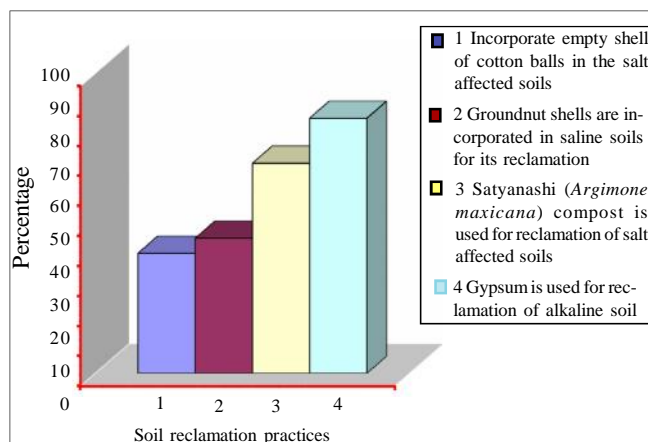
Shukla and Mishra (2011) found that combined application of *Dhaincha* (*Sesbania aculeatea*) and gypsum gave better results in comparison to other treatment combination. Thus, combination of traditional practice (green manuring) with chemical amendments play an important role in reclamation of alkali soil and better roles were played in combination because of their additive effect in all the combination than their individual application.

The present research was conducted in Bikaner district of Rajasthan. From all the selected villages, a separate list of all those farm women was prepared, who have at least one *bigha* cultivable land and a total of 150 farm women were selected by simple random

sampling technique in such a way that the number of the respondents selected from each village is proportional to the size of that village *i.e.* total number of farm women respondents in that village. For judging the scientific rationality of identified traditional soil reclamation and soil fertility management practices, a list of all the subject matter specialists of soil science available at Bikaner was prepared. Twenty SMSs from the field of soil science were randomly selected to judge the scientific rationality of the traditional soil reclamation and soil fertility management practices of their corresponding field of specialization.

To judge the scientific rationality of traditional practices pertaining to the aspect of soil reclamation and soil fertility management, twenty SMSs from field of soil science were selected. A separate questionnaire was developed for SMSs to judge the scientific rationality of traditional soil reclamation and soil fertility practices. The questionnaire for soil scientists consisted of TAPs related to soil reclamation and soil fertility management. For measuring the scientific rationality of traditional soil reclamation and soil fertility practices, responses of SMSs were collected and frequency and percentage were computed to find out the extent of scientific rationality of these traditional practices.

In the aspect of soil reclamation, 85 per cent of the SMSs had reported that the traditional soil reclamation practice of “using of gypsum for reclamation of alkali soil” had a scientific rationale, as shown in the Table 1 and Fig. 1. This practice got first rank in order of scientific

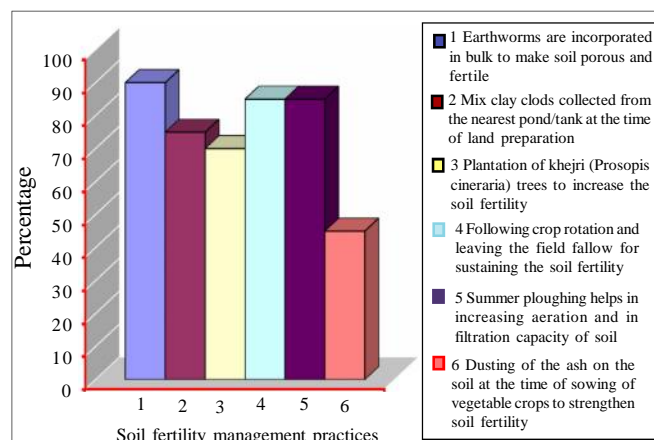


**Fig. 1 : Scientific rationality of identified traditional soil reclamation practices as perceived by the SMSs**

rationality. The probable reason may be that gypsum is a rich source of sulphur, which balances the alkali nature of soil. It may also be due to the fact that by neutralizing the pH of the alkali soil, it is helpful in making the nutrients available to the soil. In addition, it also enhances the smooth water movement in the soil. Table further depicts that only 40 per cent of the SMSs had rated the scientific rationality of the traditional soil reclamation practice of “incorporation of empty shells of cotton balls in the salt-affected soil”, hence placed at lowest rank by the SMSs. The probable reason may be that cotton shells may not be effective for reclamation of salt-affected soil but may act as a part of manure in the field.

It is also evident from the Table 1 that, out of

Table 1: Scientific rationality of identified traditional soil reclamation and soil fertility management practices as perceived by the subject matter specialists (n = 20) (Multiple response)				
Sr. No.	Traditional soil reclamation and soil fertility management practices	Frequency and percentage of SMSs denoting scientific rationality of TAPs		Rank
		Frequency	Percentage	
Soil reclamation practices				
1.	Incorporate empty shell of cotton balls in the salt affected soils.	8	40	IV
2.	Groundnut shells are incorporated in saline soils for its reclamation	9	45	III
3.	Satyanashi ( <i>Argimone maxicana</i> ) compost is used for reclamation of salt affected soils	14	70	II
4.	Gypsum is used for reclamation of alkali soil.	17	85	I
Soil fertility management practices				
1.	Earthworms are incorporated in bulk to make soil porous and fertile	18	90	I
2.	Mix clay clods collected from the nearest pond/tank at the time of land preparation	15	75	III
3.	Plantation of Khejri ( <i>Prosopis cineraria</i> ) trees to increase the soil fertility.	14	70	IV
4.	Following crop rotation and leaving the field fallow for sustaining the soil fertility	17	85	II
5.	Summer ploughing helps in increasing aeration and infiltration capacity of soil.	17	85	II
6.	Dusting of the ash on the soil at the time of sowing of vegetable crops to strengthen soil fertility	9	45	V



**Fig. 2 : Scientific rationality of identified traditional soil fertility management practices as perceived by the SMSs**

different identified indigenous soil fertility management practices, 90 per cent of the SMSs had perceived that the traditional practice of “incorporation of earth worms in bulk to make the soil porous and fertile” had a scientific rationale thus got top rank in order of scientific rationality. The rationale behind the scientific rationality of this traditional practice of incorporating earthworms in the soil may be that the earthworms are known as best friend of farmers for making soil fertile by decomposition of organic materials of soil. Earthworms also improves the soil texture, hence, are beneficial for granulation of soil, which ultimately improves the aeration in the soil. In addition earthworms can be produced by farm women in bulk at their farm by using minimum farm resources. Further, less than half of the SMSs (45%) opined about the scientific rationality of the traditional practice of “dusting of ash on the soil at the time of sowing of vegetable crops”, hence placed at lowest rank in order of scientific rationality. The probable reason behind such finding might be that dusting of ash for improving the soil fertility may be effective as ash contains minerals such as potassium, which increase the disease resistance of soil but ash is not available in bulk, hence this practice is suitable for smaller fields only.

Thus, it can be narrated from the presented results that most of the traditional agricultural practices were considered as having scientific rationale by the subject matter specialists, which enforces the fact that SMSs were in favour of traditional agricultural practices due to their scientific rationality, although most of these practices have been inherited over generations, developed by trial and error and based on indigenous

incentives, yet these are time tested and based on the logics as envisaged in the modern agricultural sciences. These practices should be further tested and scientifically proved for their worthiness as these are easily adoptable, low cost and local resources based technologies for the farming community. It has been emphasized by the researchers and planners that these scientifically proved traditional practices can supplement to the modern agricultural technologies. A blend of the modern scientific knowledge and the indigenous agricultural technology is the most appropriate approach to solve the need of the hour to achieve greater sustainability in agriculture.

## Conclusion :

In light of above findings, it can be concluded that farm women had enriched wealth of traditional agricultural practices having scientific rationality, which should be definitely recommended for further usage by the farming community to a great extent. The results of the investigation also enforce the facts that today advances in the science had considerably changed the pattern and quality of every aspect of human life through modern scientific researches. Similarly, the field of agriculture has also progressed with the support of modern scientific researches and innovations pertaining to crop production, plant protection, crop improvement and weed management but these modern agricultural innovations has reproduced several drawbacks such as residual effects. The dangers of residual effects of chemicals, pesticides and insecticides for humans were envisaged as another potent alarm. Thus, for minimizing the adverse effects due to use of agro-chemicals, which are visible on soil structure, soil micro flora, food, fodder and food materials, traditional agricultural practices and knowledge is certainly the only answer for making safe food and clean environment.

Further, if these indigenous practices got the scientific validity by the subject matter specialists, then these will definitely promote the sustainable agricultural production, resulting in proving these practices more credible, more resource conserving and more equitable for the farmers which are the ultimate consumer of these practices. Incorporation of scientific recommendations with indigenous agricultural practices will reduce environmental degradation, maintain agricultural productivity, promote economic viability and maintain self stable rural farming communities. Thus, it can be viewed as an approach to agriculture that attempts to find a balance among environmental, economic and

social aspects.

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